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Subject: **Energy Code Prescriptive  
Packages**

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The Energy Subcode now requires applicants to show compliance as part of the permit application process. There are four ways to show residential structures comply with the 1995 Council of American Building Officials Model Energy Code (CABO MEC).

The first way to show compliance is with calculations. This has been the traditional way that compliance with energy codes has been shown. It involves calculating the "U" value (thermal conductance) of the various building components (walls, floors, roofs, etc.) and showing that they are less than the code-specified maximum for the components. Guidance on how to perform the calculations can be found in the Appendix to the 1993 version of the Building Officials and Code Administrators National Energy Conservation Code.

The second way of showing compliance is with REScheck (formerly known as MECcheck) software. The software performs the calculations based on input about the shape and size of the building, and the type of insulation and equipment that the applicant proposes to use. The software is available for download from the web site [www.energycodes.gov](http://www.energycodes.gov). The New Jersey version of the software should be used, rather than the standard version of the software. Using the standard version of the software will apply more stringent energy code requirements. The software simply requires that you input the areas of the various components, the R value of insulation, and the U value of windows to be provided. The software automatically gives tradeoffs. It will allow you to use components where the insulation level exceeds code to make up for those components that do not meet code. A compliance report is generated by the software, which can be submitted with the permit application. The software must be manipulated to take advantage of the basement insulation tradeoff that is allowed in New Jersey's Energy Subcode.

Under the Energy Subcode, applicants are allowed to trade off high-efficiency heating equipment for basement wall insulation. The software does allow for the tradeoff. If you are using the tradeoff, do not enter an area for the basement and do not enter the high-efficiency equipment in the mechanical section. Then use the software

BULLETIN

as you normally would. When submitting the printout for the program, simply indicate that the tradeoff is being used and that high-efficiency equipment will be provided.

The third way of showing compliance is by enrollment in the Energy Star Program sponsored by New Jersey utility companies. The program provides incentives for projects that exceed the 1995 CABO MEC by 30 percent. A letter of enrollment from the utility company (or its consultant) should be submitted with the permit application if the applicant is choosing this compliance option.

The final way to comply is through the use of prescriptive “packages.” Included in this bulletin are tables that correspond to the three heating degree-day zones in the State. Heating degree-day zones are as such: 4,500 for Atlantic, Camden, Cape May, Cumberland, Gloucester, and Salem Counties; 5,000 for Burlington, Essex, Hudson, Mercer, Middlesex, Monmouth, Ocean, and Union Counties; 5,500 for Bergen, Hunterdon, Morris, Passaic, Somerset, Sussex, and Warren Counties. For each degree-day area, there is a table for single-family dwellings and a table for multiple-family dwellings. Each table lists several different combinations of wall insulation, floor insulation, percentage and efficiency of glazing, etc. Applicants are permitted to use any one of these packages to show compliance with the code. The applicant need only identify the package that was chosen and show details that correspond to that package on the plans. If a proposed building has window percentages and U values (a measure of the windows’ efficiency) that are equal to or lower than the values found on a line in the appropriate chart, and R values and equipment efficiencies that are equal to or higher than those listed in the chart, the building complies.

With the exception of those homes that are enrolled in the Energy Star Program, inspectors should verify that the insulation levels installed match the insulation levels used in the calculations, found in the *REScheck* printout, or shown in the prescriptive package table, as appropriate.

# Prescriptive Packages 4500 Degree-Day Region

Single-Family Detached

Single-Family Detached										
Package	Maximum		Minimum							Heating/Cooling Equipment Efficiency <sup>9</sup>
	Glazing Area Percent <sup>1</sup>	Glazing U-Value <sup>2</sup>	Ceiling R-Value <sup>3</sup>	Wall R-Value <sup>4</sup>	Floor R-Value <sup>5</sup>	Basement Wall R-Value <sup>6</sup>	Slab Perimeter R-Value <sup>7</sup>	Crawl Space Wall R-Value <sup>8</sup>		
1	13%	0.50	30	11	19	0	4	13	High Heating	UCC Basement Tradeoff
2	13%	0.45	19	13	19	0	4	13	High Heating	Basement Insulation Tradeoff Not Applied
3	13%	0.40	19	11	19	0	4	13	High Heating	
4	13%	0.30	19	11	11	0	4	13	High Heating	
5	15%	0.50	38	13	19	0	4	13	High Heating	
6	15%	0.45	30	13	19	0	4	13	High Heating	
7	15%	0.40	19	13	19	0	4	13	High Heating	
8	15%	0.30	19	11	11	0	4	13	High Heating	
9	17%	0.45	38	15	19	0	4	13	High Heating	
10	17%	0.40	30	13	19	0	4	13	High Heating	
11	17%	0.30	19	11	19	0	4	13	High Heating	
12	12%	0.55	38	13	19	9	4	12	Normal	UCC Basement Tradeoff
13	12%	0.45	30	13	15	7	2	9	Normal	
14	15%	0.55	38	16	19	9	4	12	Normal	
15	15%	0.45	38	13	19	8	3	11	Normal	
16	18%	0.50	38	19	19	9	5	13	Normal	
17	18%	0.40	30	15	19	9	5	13	Normal	
18	22%	0.40	38	16	19	9	6	13	Normal	
19	12%	0.70	26	13	13	6	0	7	High Heating	
20	15%	0.60	38	11	13	6	0	8	High Heating	
21	18%	0.60	26	13	19	8	2	14	High Heating	
22	22%	0.50	30	13	19	9	2	15	High Heating	Basement Insulation Tradeoff Not Applied
23	12%	0.60	38	13	19	9	5	13	High Cooling	
24	15%	0.50	38	14	19	9	4	12	High Cooling	
25	18%	0.45	38	15	19	9	6	13	High Cooling	
26	22%	0.40	38	19	15	8	2	10	High Cooling	Basement Insulation Tradeoff Not Applied
27	12%	0.75	30	13	11	6	0	7	High Heat/Cool	
28	15%	0.70	30	13	15	7	2	11	High Heat/Cool	
29	15%	0.60	26	13	11	6	0	7	High Heat/Cool	
30	18%	0.60	30	11	19	8	2	14	High Heat/Cool	
31	22%	0.55	38	13	19	8	2	14	High Heat/Cool	

# Prescriptive Packages 4500 Degree-Day Region

Multiple-Family

Multiple-Family											
Package	Maximum		Minimum							Heating/Cooling Equipment Efficiency <sup>9</sup>	UCC Basement Tradeoff
	Glazing Area Percent <sup>1</sup>	Glazing U-Value <sup>2</sup>	Ceiling R-Value <sup>3</sup>	Wall R-Value <sup>4</sup>	Floor R-Value <sup>5</sup>	Basement Wall R-Value <sup>6</sup>	Slab Perimeter R-Value <sup>7</sup>	Crawl Space Wall R-Value <sup>8</sup>			
1	12%	0.55	19	11	13	0	4	0	High Heating		
2	12%	0.35	13	11	13	0	4	0	High Heating		
3	15%	0.55	19	11	19	0	4	0	High Heating		
4	15%	0.35	13	11	11	0	4	0	High Heating		
5	18%	0.55	19	13	13	0	4	0	High Heating		
6	18%	0.35	19	11	11	0	4	0	High Heating		
7	20%	0.55	30	15	19	0	4	6	High Heating		
8	20%	0.35	19	11	13	0	4	0	High Heating		
9	15%	0.70	38	13	11	5	0	5	Normal	Basement Insulation Tradeoff Not Applied	
10	15%	0.65	26	11	13	6	0	6	Normal		
11	20%	0.60	26	13	19	8	3	11	Normal		
12	20%	0.55	38	13	11	5	0	5	Normal		
13	25%	0.55	38	19	13	6	2	7	Normal		
14	25%	0.45	38	13	11	5	0	5	Normal		
15	30%	0.40	38	11	13	6	2	7	Normal		
16	15%	0.90	19	11	11	5	0	5	High Heating		
17	20%	0.75	26	11	11	5	0	6	High Heating		
18	25%	0.65	30	13	11	5	0	6	High Heating		
19	30%	0.55	26	11	13	6	0	7	High Heating		
20	15%	0.75	38	13	11	5	0	5	High Cooling		
21	15%	0.70	26	13	11	5	0	5	High Cooling		
22	20%	0.60	38	13	13	6	0	6	High Cooling		
23	25%	0.50	26	13	15	7	2	9	High Cooling		
24	30%	0.45	26	13	19	9	5	13	High Cooling		
25	15%	0.90	13	11	13	6	0	8	High Heat/Cool		
26	20%	0.75	19	11	11	5	0	6	High Heat/Cool		
27	25%	0.70	38	11	13	6	0	8	High Heat/Cool		
28	25%	0.65	19	13	13	6	0	7	High Heat/Cool		
29	30%	0.60	38	11	13	6	0	8	High Heat/Cool		
30	30%	0.55	26	11	11	5	0	6	High Heat/Cool		

# Prescriptive Packages 5000 Degree-Day Region

Single-Family Detached  
Minimum

Energy Efficiency Database										
Package	Maximum		Minimum						Heating/Cooling Equipment Efficiency <sup>9</sup>	
	Glazing Area Percent <sup>1</sup>	Glazing U-Value <sup>2</sup>	Ceiling R-Value <sup>3</sup>	Wall R-Value <sup>4</sup>	Floor R-Value <sup>5</sup>	Basement Wall R-Value <sup>6</sup>	Slab Perimeter R-Value <sup>7</sup>	Crawl Space Wall R-Value <sup>8</sup>		
1	11%	0.50	30	11	19	0	4	19	High Heating	UCC Basement Tradeoff
2	13%	0.50	30	15	19	0	4	19	High Heating	
3	13%	0.45	30	13	19	0	4	19	High Heating	
4	13%	0.40	30	11	19	0	4	19	High Heating	
5	13%	0.35	19	11	19	0	4	19	High Heating	
6	13%	0.30	19	11	19	0	4	19	High Heating	
7	15%	0.45	38	15	30	0	4	19	High Heating	
8	15%	0.40	30	13	19	0	4	19	High Heating	
9	15%	0.35	30	11	19	0	4	19	High Heating	
10	15%	0.30	19	11	19	0	4	19	High Heating	
11	17%	0.40	38	15	30	0	4	19	High Heating	
12	17%	0.35	30	13	19	0	4	19	High Heating	
13	17%	0.30	19	13	19	0	4	19	High Heating	
14	12%	0.65	38	19	19	9	7	17	Normal	Basement Wall Tradeoff Not Applied
15	12%	0.45	30	13	19	9	6	17	Normal	
16	15%	0.55	38	19	21	10	*	22	Normal	
17	15%	0.40	38	13	19	9	5	16	Normal	
18	18%	0.45	38	19	19	9	7	17	Normal	
19	18%	0.35	38	13	19	9	6	17	Normal	
20	22%	0.40	49	21	19	9	6	17	Normal	
21	12%	0.75	38	11	19	8	2	17	High Heating	
22	12%	0.65	38	13	11	6	0	8	High Heating	
23	15%	0.65	30	13	19	9	2	22	High Heating	
24	15%	0.50	30	13	11	6	0	8	High Heating	
25	18%	0.55	30	13	19	9	2	22	High Heating	
26	18%	0.45	38	13	11	5	0	8	High Heating	
27	22%	0.55	38	17	19	9	2	22	High Heating	
28	22%	0.40	30	13	13	6	2	10	High Heating	
29	12%	0.75	30	13	15	7	2	14	High Heat/Cool	
30	12%	0.65	26	13	13	6	0	10	High Heat/Cool	
31	15%	0.70	30	15	19	9	2	22	High Heat/Cool	
32	15%	0.55	26	13	13	5	2	10	High Heat/Cool	
33	18%	0.65	38	19	15	7	2	14	High Heat/Cool	
34	18%	0.50	38	13	13	6	0	10	High Heat/Cool	
35	22%	0.60	38	17	26	11	8	*	High Heat/Cool	
36	22%	0.45	38	13	15	7	2	12	High Heat/Cool	

\* Indicates that the package cannot be used with that foundation type

# Prescriptive Packages 5000 Degree-Day Region

Multiple-Family

Package	Maximum		Minimum							Heating/Cooling Equipment Efficiency <sup>9</sup>	UCC Basement Tradeoff
	Glazing Area Percent <sup>1</sup>	Glazing U-Value <sup>2</sup>	Ceiling R-Value <sup>3</sup>	Wall R-Value <sup>4</sup>	Floor R-Value <sup>5</sup>	Basement Wall R-Value <sup>6</sup>	Slab Perimeter R-Value <sup>7</sup>	Crawl Space Wall R-Value <sup>8</sup>			
1	12%	0.55	19	11	13	0	4	0	High Heating		
2	12%	0.35	13	11	13	0	4	0	High Heating		
3	15%	0.55	19	11	19	0	4	0	High Heating		
4	15%	0.35	13	11	11	0	4	0	High Heating		
5	18%	0.55	19	11	13	0	4	0	High Heating		
6	18%	0.35	19	11	11	0	4	0	High Heating		
7	20%	0.55	30	15	19	0	4	6	High Heating		
8	20%	0.35	19	13	13	0	4	0	High Heating		
9	15%	0.70	38	13	11	5	0	6	Normal	Basement Wall Tradeoff Not Applied	
10	15%	0.60	26	11	11	5	0	5	Normal		
11	20%	0.60	26	13	19	9	4	15	Normal		
12	20%	0.50	26	11	13	6	0	7	Normal		
13	25%	0.50	38	13	15	7	2	10	Normal		
14	25%	0.45	38	13	11	5	0	6	Normal		
15	30%	0.40	49	13	11	5	0	6	Normal		
16	15%	0.90	19	11	11	5	0	6	High Heating		
17	20%	0.75	26	11	11	5	0	7	High Heating		
18	25%	0.70	30	13	15	7	2	13	High Heating		
19	25%	0.65	30	13	11	5	0	7	High Heating	Basement Wall Tradeoff Not Applied	
20	30%	0.60	30	13	15	7	2	14	High Heating		
21	30%	0.55	26	13	11	5	0	8	High Heating		
22	15%	0.90	30	11	11	4	0	5	High Heat/Cool		
23	20%	0.75	26	11	11	5	0	6	High Heat/Cool		
24	25%	0.65	30	11	11	5	0	7	High Heat/Cool		
25	25%	0.60	26	11	11	5	0	7	High Heat/Cool		
26	30%	0.60	38	11	19	8	2	19	High Heat/Cool		
27	30%	0.55	38	13	13	6	0	10	High Heat/Cool		

# Prescriptive Packages 5500 Degree-Day Region

Single-Family Detached

Package	Maximum		Minimum								Heating/Cooling Equipment Efficiency <sup>9</sup>	
	Glazing Area Percent <sup>1</sup>	Glazing U-Value <sup>2</sup>	Ceiling R-Value <sup>3</sup>	Wall R-Value <sup>4</sup>	Floor R-Value <sup>5</sup>	Basement Wall R-Value <sup>6</sup>	Slab Perimeter R-Value <sup>7</sup>	Crawl Space Wall R-Value <sup>8</sup>				
1	13%	0.50	38	15	30	0	4	19	High Heat/Cool	UCC Basement Tradeoff		
2	13%	0.48	38	15	30	0	4	19	High Heating			
3	13%	0.45	38	15	25	0	4	19	High Heating			
4	13%	0.40	30	13	25	0	4	19	High Heating			
5	13%	0.35	30	11	19	0	4	19	High Heating			
6	13%	0.30	19	11	19	0	4	19	High Heating			
7	15%	0.40	30	15	30	0	4	19	High Heating			
8	15%	0.35	30	13	19	0	4	19	High Heating			
9	15%	0.30	30	11	19	0	4	19	High Heating			
10	17%	0.35	38	15	30	0	4	19	High Heating			
11	17%	0.30	30	13	19	0	4	19	High Heating			
12	12%	0.55	38	18	19	9	6	17	Normal	Basement Wall Tradeoff Not Applied		
13	12%	0.40	38	13	19	9	6	16	Normal			
14	15%	0.45	38	18	19	9	6	17	Normal			
15	15%	0.35	38	13	21	10	9	18	Normal			
16	18%	0.40	49	18	19	9	6	16	Normal			
17	18%	0.35	38	16	19	9	4	14	Normal			
18	22%	0.40	49	19	30	13	*	*	Normal			
19	22%	0.35	49	18	21	10	10	19	Normal			
20	12%	0.65	26	13	19	8	2	17	High Heating			
21	12%	0.50	26	13	11	6	0	8	High Heating			
22	15%	0.60	38	13	19	9	2	20	High Heating			
23	15%	0.45	30	13	11	6	0	9	High Heating			
24	18%	0.60	38	17	19	9	2	22	High Heating			
25	18%	0.45	30	13	15	7	2	14	High Heating			
26	22%	0.50	38	17	19	9	2	22	High Heating			
27	22%	0.45	26	13	19	9	2	22	High Heating			
28	12%	0.70	26	13	19	9	2	22	High Heat/Cool			
29	12%	0.55	30	11	13	6	0	10	High Heat/Cool			
30	15%	0.60	26	13	21	10	4	30	High Heat/Cool			
31	15%	0.50	30	13	13	6	2	10	High Heat/Cool			
32	18%	0.65	38	19	21	10	3	28	High Heat/Cool			
33	18%	0.45	38	13	13	6	2	10	High Heat/Cool			
34	22%	0.50	38	16	19	8	2	20	High Heat/Cool			
35	22%	0.40	38	13	15	7	2	12	High Heat/Cool			

\* Indicates that the package cannot be used with that foundation type



# Prescriptive Packages 5500 Degree-Day Region

Multiple-Family

Package	Maximum		Minimum							Heating/Cooling Equipment Efficiency <sup>9</sup>
	Glazing Area Percent <sup>1</sup>	Glazing U-Value <sup>2</sup>	Ceiling R-Value <sup>3</sup>	Wall R-Value <sup>4</sup>	Floor R-Value <sup>5</sup>	Basement Wall R-Value <sup>6</sup>	Slab Perimeter R-Value <sup>7</sup>	Crawl Space Wall R-Value <sup>8</sup>		
1	12%	0.55	19	11	13	0	4	0	High Heating	
2	12%	0.35	13	11	13	0	4	0	High Heating	
3	15%	0.55	19	11	19	0	4	0	High Heating	
4	15%	0.35	13	11	11	0	4	0	High Heating	
5	18%	0.55	19	13	13	0	4	4	High Heating	
6	18%	0.35	19	11	11	0	4	0	High Heating	
7	20%	0.55	30	15	19	0	4	6	High Heating	
8	20%	0.35	30	11	13	0	4	0	High Heating	
9	15%	0.70	38	13	11	6	0	6	Normal	
10	15%	0.60	19	13	13	6	0	7	Normal	
11	20%	0.60	38	13	15	8	2	11	Normal	
12	20%	0.50	26	13	11	5	0	6	Normal	
13	25%	0.50	30	13	19	9	5	15	Normal	
14	25%	0.45	49	13	11	5	0	6	Normal	
15	25%	0.40	26	11	11	6	0	6	Normal	
16	30%	0.45	38	18	13	6	2	8	Normal	
17	30%	0.40	26	11	19	9	4	14	Normal	
18	30%	0.35	26	13	11	5	0	5	Normal	
19	15%	0.90	19	11	11	5	0	6	High Heating	
20	20%	0.75	26	11	11	5	0	7	High Heating	
21	25%	0.65	38	11	11	5	0	7	High Heating	
22	25%	0.60	26	11	11	5	0	6	High Heating	
23	30%	0.60	26	13	19	8	2	19	High Heating	
24	30%	0.55	26	11	13	6	0	10	High Heating	
25	20%	0.75	19	11	13	6	0	9	High Heat/Cool	
26	25%	0.65	30	11	11	5	0	7	High Heat/Cool	
27	25%	0.60	19	11	11	5	0	7	High Heat/Cool	
28	30%	0.60	38	13	13	6	0	9	High Heat/Cool	
29	30%	0.55	19	13	13	6	0	10	High Heat/Cool	
UCC Basement Tradeoff										
Basement Wall Tradeoff Not Applied										



## FOOTNOTES:

1. Glazing area is the ratio of the area of the glazing assemblies (including sliding glass doors, skylights, and basement windows, but excluding opaque doors) to the gross wall area, expressed as a percentage. Up to 1% of the total glazing area may be excluded from the U-value requirement. For example, 3 ft.<sup>2</sup> of decorative glass may be excluded from a building design with 300 ft.<sup>2</sup> of glazing area.

2. Glazing U-values must be tested and documented by the manufacturer in accordance with the National Fenestration Rating Council (NFRC) test procedure. Center-of-glass U-values cannot be used.

3. The ceiling R-values do not assume a raised or oversized truss construction. If the insulation achieves the full insulation thickness over the exterior walls, R-30 insulation may be substituted for R-38. Ceiling R-values represent the sum of cavity insulation plus insulating sheathing (if used). For ventilated ceilings, insulating sheathing must be placed between the conditioned space and the ventilated portion of the roof.

4. Wall R-values represent the sum of the wall cavity insulation plus insulating sheathing (if used). Do not include exterior siding, structural sheathing, and interior drywall. For example, an R-19 requirement could be met *EITHER* by R-19 cavity insulation *OR* R-13 cavity insulation plus R-6 insulating sheathing. Wall requirements apply to wood-frame or mass (concrete, masonry, log) wall constructions, but do not apply to metal-frame construction.

5. The floor requirements apply to floors over unconditioned spaces (such as unconditioned crawl spaces, basements, or garages). Floors over outside air must meet the ceiling requirements.

6. Walls of conditioned basements below uninsulated floors must be insulated from the top of the basement wall to a depth of 10 ft. below ground level or to the level of the basement floor, whichever is less. The entire opaque portion of any individual basement wall with an average depth less than 50% below grade must meet the same R-value requirement as above-grade walls. Windows and sliding glass doors of conditioned basements must be included with the other glazing. Basement doors must meet the door U-value requirement described in Note b.

7. The R-value requirements are for unheated slabs. Add an additional R-2 for heated slabs. For packages with a slab insulation requirement, the insulation must extend a total linear distance of at least 24 in. The insulation must extend 1) down from the top of the slab; 2) down from the top of the slab to the bottom of the slab and then horizontally underneath the slab; or 3) down from the top of the slab to the bottom of the slab and then horizontally away from the slab, with pavement or at least 10 in. of soil covering the horizontal insulation.

8. The crawl space wall R-value requirements are for walls of unventilated crawl spaces. The crawl space wall insulation must extend from the top of the wall (including the sill plate) to at least 12 in. below the outside finished grade. If the distance from the outside finished grade to the top of the footing is less than 12 in., the insulation must extend a total vertical plus horizontal distance of 24 in. from the outside finished grade.

9. *High Heating* means a furnace AFUE of 90% or more, or a heat pump HSPF of 7.8 or more. *High Cooling* means a SEER of 12 or more. *High Heat/Cool* means both heating and cooling equipment must meet these minimum efficiencies. If you plan to install more than one piece of heating equipment or more than one piece of cooling equipment, the equipment with the lowest efficiency must meet or exceed the efficiency required by the selected package.

## NOTES:

a) Glazing areas and U-values are maximum acceptable levels. Insulation R-values are minimum acceptable levels. R-value requirements are for insulation only and do not include structural components.

b) Opaque doors in the building envelope must have a U-value no greater than 0.35. Door U-values must be tested and documented by the manufacturer in accordance with the NFRC test procedure. If a door contains glass and an aggregate U-value rating for that door is not available, include the glass area of the door with your windows and use the opaque door U-value to determine compliance of the door. One door may be excluded from this requirement (i.e., may have a U-value greater than 0.35).

c) If a ceiling, wall, floor, basement wall, slab edge, or crawl space wall component includes two or more areas with different insulation levels, the component complies if the area-weighted average R-value is greater than or equal to the R-value requirement for that component. Glazing or door components comply if the area-weighted average U-value of all windows or doors is less than or equal to the U-value requirement (0.35 for doors).

BULLETIN NO.

03-2

BULLETIN